Yield response of Manitou Wheat

to NP fertilizers on stubble. 1969-71

by W.F. Nuttall

The average yield response of Manitou wheat to nitrogen and phosphate fertilizers on stubble at Melfort is shown in Table 1 for the period 1969 to 1971. Both nitrogen and phosphate fertilizers increase yields and produced substantial economic returns on fertilizer investment.

The average soil tests for nitrogen and phosphorus were 45 lb N and 26 lb P per acre, within the range of soil test levels in which response would be expected.

Response to nitrogen was greater in 1970 than in 1969 (Table 2), although the soil test for nitrogen was the same (50 lb/ac) on both field plots. The soil test for P was higher (34.6 lb P/acre) in 1970 and also, more rainfall was received during the growing season. These two factors would contribute to greater nitrogen fertilizer response and higher crop yields. Yield response to phosphate fertilizer in 1969 was substantially greater than in 1970 because of low (10.6 lb P/acre) available phosphorus in the soil. Forty pounds of N fertilizer per acre produced a yield increase of 138 lb per acre but with the addition of 20 lb of P_2O_5 acre increased yield response to 852 lb per acre.

Soil moisture, available soil phosphorus and soil nitrogen would account for most of the yield differences among the field plots in these years. Soil moisture cannot be predicted throughout the growing season, however, initial soil moisture can be measured as well as available nitrogen and phosphorus. Initial soil moisture conditions in the spring of the year in northern regions of the prairies have been optimum to above optimum during the past two years and soil moisture in northeastern Saskatchewan soils will be sufficient for seeding stubble crops in 1975.

Comment: It was suggested a possible experiment may be set up assimulating responses from anhydrous ammonia by using urea. The thought being that urea would hydrolize to ammonia in the soil.

Table 1

Average yield response of Manitou Wheat to NP fertilizers grown on stubble

SOIL TYPE - MELFORT sic
1969-1971

phosphate fertilizer (lb P_2O_5/ac)	Fertilizer N (lb/ac) 0	20	40	60	120
	yield in lb/ac				
0	0	193	422	551	741
20		333	667	666	1064
40	-54	392	653	780	1170
60			699		1074
80			754		977

*Economic return over fertilizer cost

0	0.0	10.51	23.54	29.57	33.87
20		16.31	36.69	33.62	52.48
40	-11.78	16.44	31.71	37.60	55.90
60			30.93		45.18
80			30.78		34.39

* Wheat - 7¢/lb
N -15¢/lb
P_2O_5 -20¢/lb

Table 2

Yield response of Manitou Wheat to NP fertilizers at two soil test levels of P on Melfort sic

Year	Phosphate fertilizer (lb P_2O_5/ac)	Soil N 50 lb/ac: Fertilizer N (lb/ac) 0	20	40	60	120
		soil P 10.6 lb/ac				
1969	0	0	19	138	132	426
	20		511	852	814	1044
	40	-78	798	678	678	1158
	60			810		1123
	80			792		840
		soil P 34.6 lb/ac				
1970	0	0	468	918	1182	1530
	20		429	666	1269	1536
	40	36	390	828	1356	1716
	60			931		1602
	80			931		1674